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EXAMINER

SHORTSLE, KEVIN P

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 07/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/941,476

Applicant(s)

WHITMAN, JOHN

Examiner

Kevin P. Shortsle

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 44-46 and 48-57 is/are allowed.
- 6) ☒ Claim(s) 13-21, 24-29, 31-33, 35-37, 41-42, 47 and 58-60 is/are rejected.
- 7) ☒ Claim(s) 22, 23, 30, 34, 38-40, 43 and 61 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 47 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what proper fluid pressure and level means. Such language is not defined to allow one in the art to ascertain the scope that proper fluid pressure and level comprises. No values have been presented in the instant application to describe a proper fluid pressure or level.

### ***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 13, 15 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth (USPN 5,750,317) in view of Gordon (USPN 5,066,616) and Yoda et al. (USPN 5,876,882). Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but also suggests other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would

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appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions as is taught and suggested by Gordon.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Regarding claims 19 and 20, Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to dispense solvent and actuate the holding mechanism after the photoresist is dispensed and rotated, but also suggests other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions as is taught and suggested by Gordon.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol and aliphatic ester. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol and aliphatic ester. One in the art would appreciate diacetone alcohol and aliphatic ester are well known and conventional solvents used in

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the preparation of photoresist. It is well known and conventional to use diacetone alcohol and aliphatic ester as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34, 36, 39). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol and aliphatic ester to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol and aliphatic ester to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Regarding claims 15 and 16, Gordon discloses the claimed method steps (See Col. 3, lines 20 – 40).

Regarding claim 17, Orth discloses the claimed method steps (See Fig. 2).

Regarding claim 18, Gordon teaches the solvents are the same (See Col. 6, lines 43, 56).

5. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied in paragraph 4 to claims 13 and 19 above, and further in view of Hayes et al. (USPN 5,849,084). Orth discloses two nozzles, one for photoresist the other for solvent. One in the art would appreciate a second photoresist nozzle in order to provide proper coverage of the wafer, especially with the art generally moving to increase wafer dimensions. It is known and conventional to provide a third nozzle for the dispensing of photoresist as shown, for example, by Hayes et al. (See Col. 3, lines 35 – 40, 60 – 64 and Col. 6, lines 40 – 45). It would have been obvious to one of

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ordinary skill in the art at the time of the invention to provide Orth with another photoresist nozzle in order to properly cover the entire surface of the wafer with photoresist as is taught and suggested by Hayes et al.

6. Claims 24, 26 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth in view of Gordon, Yoda et al. and Hayes et al. Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but also suggests other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions as is taught and suggested by Gordon.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines

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42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth discloses two nozzles, one for photoresist the other for solvent. One in the art would appreciate a second photoresist nozzle in order to provide proper coverage of the wafer, especially with the art generally moving to increase wafer dimensions. It is known and conventional to provide a third nozzle for the dispensing of photoresist as shown, for example, by Hayes et al. (See Col. 3, lines 35 – 40, 60 – 64 and Col. 6, lines 40 – 45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Orth with another photoresist nozzle in order to properly cover the entire surface of the wafer with photoresist as is taught and suggested by Hayes et al.

7. Claims 28 – 29, 31, 37, 41 – 42, 58 – 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth in view of Gordon, Yoda et al. and Hasebe et al. (USPN 5,658,615). Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable base, a logic



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control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but also suggests other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions as is taught and suggested by Gordon.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to

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the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head as is taught and suggested by Hasebe et al.

Regarding claim 37, the references are applied for the same reasons set forth in the discussion of claim 28 above.

Regarding claim 42, Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and a bulk solvent, a rotatable base, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but also suggests other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to

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photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions as is taught and suggested by Gordon.

Orth is also silent to the source of bulk solvent containing the bulk solvent that includes diacetone alcohol and aliphatic ester. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol and aliphatic ester. One in the art would appreciate diacetone alcohol and aliphatic ester are well known and conventional solvents used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol and aliphatic ester as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34, 36, 39). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol and aliphatic ester to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol and aliphatic ester to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

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Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head as is taught and suggested by Hasebe et al.

Regarding claim 58, Orth discloses an apparatus comprising: a track coating unit coupled to a source of solvent having a solvent dispense head, a rotatable base, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface, and dispensing solvent on the edges and sides of the wafer for edge bead removal (See Figs. 2, 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but also suggests other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions. It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist

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on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions as is taught and suggested by Gordon.

Orth is also silent to the bulk solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth is silent to a bulk solvent container. One in the art would appreciate a container holds the solvent to be supplied to the solvent dispense head. It is well known and conventional to provide a bulk solvent container as shown, for example, by Hasebe et al. (See Fig. 1, item 7b). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Orth with a bulk solvent container as is well known and conventional in the art when supplying a solvent to a dispense head as is taught and suggested by Hasebe et al.

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Regarding claim 59, Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head as is taught and suggested by Hasebe et al.

Regarding claim 60, Yoda et al. teaches an aliphatic ester may also be used as the solvent with the diacetone alcohol (See Col. 7, lines 33 – 39).

Regarding claims 29 and 41, Gordon teaches the solvents are the same (See Col. 6, lines 43, 56).

Regarding claim 31, Orth discloses the claimed method steps (See Fig. 2).

8. Claims 32-33, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orth in view of Gordon, Yoda et al., Hayes et al. and Hasebe et al. Orth discloses an apparatus comprising: a solvent dispense head in fluid communication with a source of photoresist and solvent, a rotatable wafer-holding mechanism, a logic control unit that executes the process of distributing solvent and photoresist on the wafer surface (See Figs. 6 – 7, items 22, 8, 10, 4, 6). Orth teaches to distribute solvent after the photoresist, but also suggests other methods may be employed by the logic control unit (See Fig. 3 and Col. 5, line 44). One in the art would appreciate distributing solvent before the photoresist in order to prevent mottling by providing a uniform coating of photoresist and reduce the sensitivity of the photoresist to minor changes in conditions.

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It is known and conventional to distribute solvent prior to photoresist on a wafer as shown, for example, by Gordon (See Col. 3, lines 20 – 40, 3 – 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process executed by the logic control unit of Orth to distribute the solvent prior to the photoresist in order to provide a uniform coating of photoresist on the wafer and reduce the sensitivity of the photoresist to minor changes in conditions as is taught and suggested by Gordon.

Orth is also silent to the source of solvent containing a solvent that includes diacetone alcohol. Gordon teaches that the solvent distributed by the apparatus is the same solvent used to prepare the photoresist (See Col. 5, lines 48 – 50 and Col. 6, lines 42-43, 55-56). However, Gordon does not expressly teach or suggest diacetone alcohol. One in the art would appreciate diacetone alcohol is a well known and conventional solvent used in the preparation of photoresist. It is well known and conventional to use diacetone alcohol as the solvent in photoresist as shown, for example, by Yoda et al. (See Col. 7, lines 21-22, 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to supply diacetone alcohol to the dispense head of Orth as is a well known and conventional solvent for photoresists as shown by Yoda et al. It is noted that one in the art choosing diacetone alcohol to prepare the photoresist would also choose the same in order to obtain the advantages disclosed by Gordon – no unexpected results are achieved.

Orth discloses two nozzles, one for photoresist the other for solvent. One in the art would appreciate a second photoresist nozzle in order to provide proper coverage of

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the wafer, especially with the art generally moving to increase wafer dimensions. It is known and conventional to provide a third nozzle for the dispensing of photoresist as shown, for example, by Hayes et al. (See Col. 3, lines 35 – 40, 60 – 64 and Col. 6, lines 40 – 45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide Orth with another photoresist nozzle in order to properly cover the entire surface of the wafer with photoresist as is taught and suggested by Hayes et al.

Orth is also silent to solenoids that control the flow of photoresist and solvent. One in the art would appreciate solenoids are well known and conventionally employed to control the flows of liquid supply as shown, for example, by Hasebe et al. (See Col. 4, lines 42 – 47, Col. 5, lines 46 – 48, 58 – 61 and Col. 6, lines 6 – 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to include solenoids in Orth to control the flows of the photoresist and solvent supplied to the discharge head as is taught and suggested by Hasebe et al.

9. Claims 25 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied in paragraph 6 to claim 24 above and the references applied in paragraph 8 to claim 32, and further in view of Ikeno et al. (USPN 4,886,012). Regarding claim 25, Orth is silent to the first and second nozzles in fluid communication with the solvent source. One in the art would appreciate the increased flexibility of the nozzles having a dual function. It is known and conventional to connect nozzles to both a solvent source and photoresist source as shown, for example, by Ikeno et al. (See Figs. 3-4 and Col. 5, lines 10 – 68). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the first and second nozzles of Orth to



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be in fluid communication with the solvent source as shown by Ikeno in order to increase the flexibility and functionality of the apparatus.

Regarding claim 35, the prior art discloses that the solvent supplied and the solvent of the photoresist are the same, but does not teach that the source is from a common bulk solvent. One in the art would appreciate a common bulk solvent is used in order to simplify the apparatus. It is known and conventional to provide a single bulk solvent source as shown, by Ikeno et al. (See Fig. 3, items 18, 19). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a common bulk solvent to Orth in order to simplify the apparatus and decrease the amount of space required for the apparatus.

### ***Response to Arguments***

10. Applicant's arguments filed 4/30/02 have been fully considered but they are not persuasive. Gordon is applied to Orth to teach the advantages of supplying solvent before photoresist: the logic control unit of Orth is capable of executing the process disclosed by Gordon. Gordon also teaches that solvents supplied to the wafer are the same solvents used to produce photoresist. Many organic solvents, such as diacetone alcohol and aliphatic esthers, are well known and conventionally used to produce photoresist and are disclosed by Yoda et al. Therefore, it would have been obvious to one of ordinary skill in the art to choose any of the solvents or mixtures thereof described by Yoda et al., which are known and conventionally used to produce photoresist, and in view of the teachings of Gordon supply said solvent to the wafer. An express suggestion to substitute one equivalent component or process for another is

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not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982) and also MPEP 2144.06. It is noted that Yoda et al. discloses ethyl acetate as a solvent used to produce photoresist. It is brought to applicant's attention that ethyl acetate is an example of an aliphatic ester. No showing is provided as such would be readily available to one of ordinary skill in the art. Also, Lehmann et al. (USPN 4,487,823) was cited in the previous Office Action to teach that butyl acetate, which is also disclosed by Yoda et al., is an aliphatic ester.

In response to applicant's argument that the prior art relied upon does not suggest the desirability of using diacetone alcohol or diacetone alcohol and aliphatic ester as a solvent with a low vapor pressure and slow evaporation rate to reduce the amount of prewet solution, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

With respect to the arguments of claims 14 and 21, Hayes et al. is applied to teach a second nozzle for supplying photoresist, in addition to the first and second nozzles disclosed by Orth, is used to properly cover the wafer with photoresist.

With respect to the arguments of claims 24-25, 28, 32, 35-37, 42, 58, the combination of references teach and suggest all the particulars of the claimed apparatus as described in detail above in the body of the rejections.

### ***Allowable Subject Matter***

11. Claims 44-46 and 48-57 are allowed for the reasons set forth in the previous Office Action.

12. Claims 22-23, 30, 34, 38-40, 43 and 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claim 47 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

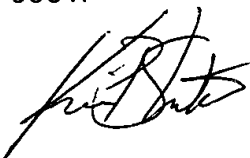
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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

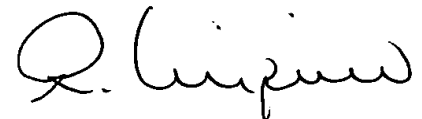
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Shortsle whose telephone number is 703-308-8193. The examiner can normally be reached on M-F, 8-4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard D. Crispino can be reached on 703-308-3853. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



K. P. Shortsle  
July 15, 2002



RICHARD CRISPINO  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700